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GEOGRAPHIC SCHOOL BULLETINS

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U. S. Army Engineers

NEW HIGHWAYS ADVANCE BY BOAT THROUGH CANADA'S FORESTS

Mud and dust, drizzling rain and freezing nights, rushing streams, and stinging hordes of mosquitoes were among the hostile forces which the U. S. Army Engineers and their civilian co-workers battled on a near-home front in Canada as the Alaska Highway was completed in record time in 1942. In 1943 the main highway was provided with many miles of side roads. When rivers crossed the right-of-way, temporary pontoon bridges were placed so that workers and equipment could cross and push the road farther through the wilderness, while behind them the bridgebuilders put up permanent structures. The pontoons were aluminum boats which the work crews could carry (above). In Canada's northern summer, portaging a metal boat is hot work; the men stripped to the waist acquired a fine sun tan, but the others lost less time discouraging mosquitoes (Bulletin No. 2).

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GEOGRAPHIC SCHOOL BULLETIN

HOW TEACHERS MAY OBTAIN THE BULLETINS

The Geographic School Bulletins are published weekly throughout the school year (thirty issues) and will be mailed to teachers in the United States and its possessions for one year upon receipt of 25 cents (stamps or money order); in Canada, 50 cents. Originally entered as second-class matter January 27, 1922; re-entered as of April 27, 1943, Post Office, Washington, D. C., under Act of March 3, 1879. Copyright, 1944, by National Geographic Society, Washington, D. C. International copyright secured. All rights reserved. Quedan reservados todos los derechos.

France's "Rocket Gun" Coast: An Invasion Doorstep

THE "rocket gun" coast is what the news reports now call that England-ward coastal thrust of northeast France spearheaded by Calais. Repeated Allied bomber attacks on unidentified targets in this area lend the region an ominous air of being studded with secret and menacing weapons.

Its most potent menace, however, is geography. The shape of Europe is such that the Calais coastal bulge, between Dieppe on the southwest and Dunkerque on the east, pushes the continent closest to England. The water gap between is only 19.8 miles across.

Coasts 5½ Minutes Apart by Bomber

The nearness to England was the reason for peacetime's incessant stream of travel between the French port of Calais and Dover, only 22 miles (5½ or 6 minutes by bomber) away on southeast England's shores. Between three and five million travelers a year crossed the threshold of France at Calais before the war. Boulogne, only 20 miles west of Calais, is 30 miles (7½ or 8 minutes) from English shores; Dieppe 66 miles and 16 minutes. These cities, with Dunkerque to the east, in peacetime are four of the six busiest ports on France's Channel coast.

Actually, the coastal points nearest to England are a pair of bold headlands six miles apart: Cap Blanc Nez (Cape White Nose), a white chalk cliff five miles west of Calais, and Cap Gris Nez (Cape Gray Nose), a gray sandstone bluff rising 167 feet high. These stone walls of France resemble England's white cliffs of Dover on the opposite side of the Channel cleft.

Northeast of the two capes begins the shoreline of French Flanders, resembling that of Belgium and the Netherlands, with salt marshes, stretches of sand dunes, windmills, and dikes. Dunkerque (Dunkirk) owes its name to an old church ("kirk") among these dunes.

Pioneer Fliers Crossed Channel There

Roman legions started the fateful succession of invasions that have crossed the Channel there. The Romans set sail against England in 43 A.D. from what is now Boulogne. William the Conqueror, turned back by bad weather farther west, launched his victorious attack against England in September, 1066, from St. Valery-sur-Somme, between Boulogne and Dieppe. In 1804-5 Napoleon assembled around Boulogne the forces for an invasion he never dared to try.

Meanwhile British armies demonstrated the convenience of this area for invasions, incoming as well as outgoing. Boulogne was kidnapped by the British in 1544 and held until the French ransomed it back six years later. Calais was British from 1347 until 1558.

In 1785 the venturesome Blanchard and Jeffries ballooned over from England to land just west of Calais. Louis Blériot's first Channel crossing in an airplane in 1909 ended less than two miles from Calais.

Note: France's "rocket gun" coast may be found on the National Geographic Society's Map of Europe and the Near East. A price list of maps may be obtained from the Society's headquarters in Washington, D. C. For additional information about northern France, see "The Coasts of Normandy and Brittany," in the *National Geographic Magazine* for August, 1943; "Rehearsal at Dieppe," October, 1942; and "France Farms As War Wages," February, 1940*. *(Issues marked by an asterisk are included in a special list of Magazines available to teachers at 10¢ each in groups of 10.)*

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Maynard Owen Williams

WATER-COOLED WATER BUFFALOES ARE TRAFFIC HAZARDS THAT MODERN TURKEY IS TRYING TO BY-PASS

The patient water buffalo of Asia pulls Turkey's old-fashioned two-wheel cart whose primitive wheels are solid wooden disks rimmed with iron. Leisurely buffaloes may balk, mule-like, and demand a cooling shower (above). Modern Turkey, seeking to escape the handicap of such slow and whimsical transportation, made 1943 notable for the mileage of new highways suitable for automobile traffic. A 312-mile road was finished from Ankara, the nation's capital, to Istanbul, the ancient metropolis on the Bosporus. Other new roads radiated from Ankara across the Anatolian plateau to Mersin in the south and Erzurum in the east. The new 1,600-foot-long Batman Bridge, between Siird and Diyarbakir, is Turkey's longest span, outstanding among 1943's engineering achievements (Bulletin No. 2).

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Engineering Works of 1943 Spurred by War Needs

ARMY engineers and civilian construction experts in 1943 found their work a spectacular part of the war. New roads were rushed to completion to carry supplies to new out-of-the-way bases, new bridges were rushed to carry the roads, new railways and subways completed to speed soldiers, materiel, and war workers on the performance of their duties.

One of 1943's engineering achievements was "the most expensive road in the world," built in Surinam to connect Zanderij Field with Paramaribo. U. S. Army Engineers built it, on a base of solid mahogany, and surfaced it with bauxite, the ore of aluminum. These materials, precious elsewhere, were the cheapest available in Surinam, where they are abundant (illustration, next page).

Chicago Becomes a Seaport by Lifting Bridges

Canada has announced the completion of a coast-to-coast highway. U. S. Army Engineers built another Canadian supply route, from Peace River in northern Alberta to Providence on Great Slave Lake in the Northwest Territories. Hundreds of miles of new roadway have been built in Canada to feed the new Alaska Highway (illustration, cover). Its bridges include a 2,275-foot span over Peace River.

War needs also hastened the building of lifts for Chicago's 18 bridges over the Chicago River, allowing ships to navigate that river and linking the city with the sea by way of the Mississippi.

Peru opened a new road between Lima and Iquitos to bring produce from the interior to the Pacific coast.

Turkey has pushed the building of highways and bridges as part of the nation's modernization program (illustration, inside cover). Portugal opened its largest bridge, a structure over the River Mondego. A new bridge in Iraq, where the Tigris and the Euphrates meet, was built with a central span that sinks under water to permit river boats to pass. A highway bridge at Hobart, on the island of Tasmania, south of Australia, almost 4,000 feet long, stands on concrete floats, with hinged ramps at either end to allow for an 8-foot tide.

White Coal Saves Black, Pipes Save Rails

The U.S.S.R. has completed a long strategic rail line in the Kazak S.S. Republic in Central Asia. In subarctic European Russia a new 1,150-mile railroad runs from Komosha to Kotlas and Vorkuta. It connects with Leningrad and Moscow, giving the latter city access to the Pechora River coal fields.

Moscow also built a four-mile subway from the center of the city to industrial suburbs on the southwest. Chicago's new subway, the city's first, is nearly five miles long and forty feet underground at the State Street station. New York City has opened four and a half additional miles of subway. Also the city has put in partial operation 42 miles of the 85-mile Delaware Aqueduct to supplement the water supply.

Romania has finished a large hydroelectric plant at Piatra-Neamt. The hydroelectric plant on the Shipshaw River in Quebec is now supplying power for Canadian aluminum production. The plant will generate a million horsepower and relieve by that amount the demand for coal to power industry.

Chicago built the world's second-largest mill for manufacturing aluminum

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Donald McLeish

AT DIEPPE THE COAST OF FRANCE TAKES A NORTHWARD TURN TOWARD ENGLAND

This prewar photograph shows the fashionable beach-resort aspect of Dieppe—the spacious Esplanade, the broad Boulevard de Verdun, the hotels, the Casino, the points of interest that attracted sightseers on leisurely vacation mornings. The city still had its 500-year-old Castle and the even older Gothic church of St. Jacques, admired for its stained glass windows. Dieppe marks the beginning of the northward trend of the wedge which France pushes toward England. Because of its proximity to Britain, the whole wedge area has seen modern warfare that could crush the old castle's heavy ramparts like an infant's plaything. On August 19, 1942, the beach of Dieppe (left) was one of the six places where Allied troops made landings in their historic "rehearsal raid" of the continent. The vicinity is remarkable for its chalk cliffs (left background).

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Antimony: A Teamwork Metal

FEW citizens of the United States (except workers in certain factories) have ever seen a piece of antimony. Yet more than 30,000 tons of the metal were used in the country's industry in 1942, the last year for which records are complete. It went into things that affect the daily lives of everybody at home and on the war fronts.

The reason that antimony is so little known is that the element is strictly a teamworker. There is scarcely a use for the metal in its pure state. But combined with certain other metals, especially lead, it contributes highly valuable characteristics to the mixtures.

From Type to Telegraph, Antimony Helps Out

American engineers have found how important antimony's role can be in the country's highly industrialized civilization, with the result that the United States uses more of the element than any other nation. In general, antimony does for the soft metals, lead and tin, much the same service that tungsten, vanadium, and other toughening elements do for steel.

Antimony's undercover helpfulness in your daily life starts with the morning newspaper. It bolsters up the otherwise too soft mixture of lead and tin to make almost perfect type metal. Particularly valuable is antimony's property of expanding as it solidifies. This forces the type metal snugly into all parts of the mold, bringing out even the faintest lines of the type design.

Your breakfast is probably prepared in enameled pots and pans, the gleaming surfaces of which are made from one of the oxides of antimony.

Telephone and telegraph messages speed over cables sheathed in antimony and lead (illustration, next page). Antimony reinforces lead pipes for plumbing. The bearings of many machines are of Babbitt metal, an alloy in which tin predominates, with a dash of copper, and proportionately two dashes of antimony. Hidden in numerous other commodities, from textile dyes to medicine, antimony contributes its share to the paraphernalia of modern living.

Neighbors to the South Contribute

When you step on the starter of your automobile you are calling on antimony for its greatest contribution. Number one use of the metal is in storage batteries. Alloyed with lead, it furnishes for the battery plates a sturdy framework that is not harmed by the sulphuric acid in which it is immersed. On the other hand, the soft spongy lead and the lead peroxide that are held in the frames to form the battery plates are affected by the acid. It is planned that way, for this is the chemical action that releases electricity.

In addition to doing a huge war job through hundreds of thousands of storage batteries in jeeps, trucks, and tanks, antimony performs direct military service. Many tons give necessary hardness to shrapnel balls and bullet cores.

Antimony sulphite is used in antiaircraft shrapnel shells because the white smoke puffs it produces help gunners to mark and adjust their range.

In the matter of antimony ores, the United States is virtually a have-not nation. Fifteen years ago the country looked to China for most of its supply of the metal, and was nearly as dependent on the Far East for this material as for rubber. Since then, Mexico and Bolivia have developed antimony mines.

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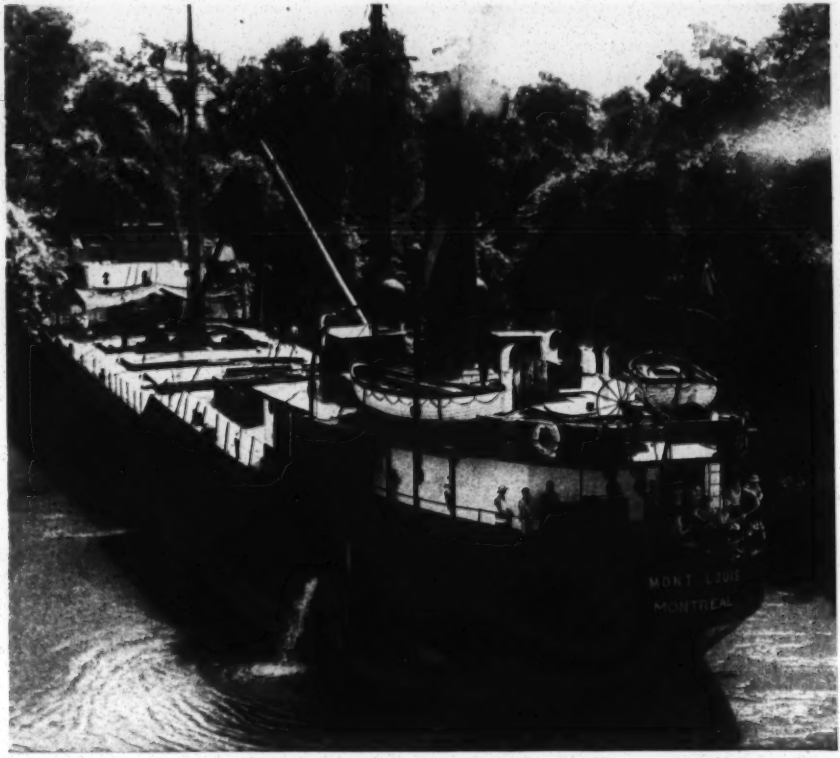
sheet. The new aluminum plant in Maspeth, Queens County, New York, is the country's largest production unit built with government funds.

Douglas Dam, on the French Broad River in Tennessee, was completed and began power production March 1, 1943. Another TVA dam, Ocoee No. 3, is also ready.

The year 1943 set a new record with completion of the world's longest pipe line, the 1,338-mile, 24-inch line from Texas oil fields to east coast refineries. It will deliver about 300,000 barrels of oil daily, and relieve the pressure on rail and ship transportation. Another emergency pipe line is being built from the oil wells at Norman, on the Mackenzie River in the wilds of northwest Canada, to the new refinery at Whitehorse, Yukon Territory.

New pipe extends from Steubenville, Ohio, to refineries at Marcus Hook, Pennsylvania, and thence to Washington, D. C., and 19 other eastern cities. Also opened in 1943 was the pipe line from Carrabelle, on Florida's Gulf coast, to Jacksonville, 200 miles across the State.

Bulletin No. 2, January 17, 1944.



Philip Hanson Hiss

HIGHWAYS ARE COMING TO THE RESCUE OF SURINAM'S CROWDED WATERWAYS

The new highway from the jungle hinterland into Paramaribo will relieve some of the shipping problems hitherto encountered on Surinam's rivers. Steamers have brought their cargoes from roadless jungle over rivers too narrow for ships to pass. To allow another vessel to go around, the Canadian ship *Mont Louis* (above) squeezes her prow into a shallow tributary of the Cottica River, at the risk of getting stuck. Most of Surinam's shipping carries bauxite, the ore from which the United States makes aluminum. American troops have been in this Netherlands colony in South America since December 3, 1941, protecting the chief foreign source of the metal for American aircraft.

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Wartime Washington Works

WITH American forces attacking and defending at hundreds of points around the globe, how can the right supplies reach the right place to fill life-and-death needs? How guarantee fuel for Arctic posts and quinine for malarial battle-fronts in the tropics? How tell anxious families which fliers manned a particular wrecked plane? How know which equipment is where, so as to send replacement parts of the right size? Who collects, organizes, and supplies the information needed by lawmakers and military leaders in mapping the nation's strategy?

Look at workaday Washington for the answer. The extra work of keeping track of war and warriors around the world has furrowed the face of the United States capital city with new lines of buildings.

The Mall, which in peacetime was an open greensward extending nearly two miles from the Capitol to the Lincoln Memorial, is broken out all over with temporary office buildings. A vast improvement over the temporary structures of World War I, the new "tempos" cover 53 acres of ground. One of the larger ones was built in 38 working days.

For quick communication between the main Navy Department building and annex "tempos," second-story enclosed footbridges cross the reflecting pool that lies tranquilly between the Washington Monument and the Lincoln Memorial.

City-in-Itself Building Houses 32,000 Persons

Larger than any hotel is Arlington Farms, federal dormitory on the Virginia side of the Potomac across from Washington, with 6,160 rooms for government girls. Neatly furnished rooms are rented at $24.50 per month each.

Population of the Capital area has jumped 25 per cent since 1940, to a present total of about 1,250,000. Civilian government workers in Washington number 295,000—more than double the war peak of 1918. Yet since early 1942, some 35,000 jobs in non-war government agencies have been transferred from the District of Columbia to relieve the critical shortage of housing and office space.

More than 100,000 passengers daily pass through the train gates at Washington's Union Station. Information clerks answer 80,000 questions a day.

Much of the city's new growth has spilled over from the District's 69-square-mile area into near-by sectors of Maryland and Virginia. Some of the most important wartime structures are not within the District's boundaries.

The Army's huge Pentagon Building, across the Potomac in booming Arlington County, Virginia, is now manned by more than 32,000 workers, both military and civilian. It has 16½ miles of corridors, 21,000 desks, 1,500 electric clocks, 20 restaurants and beverage bars serving 55,000 meals, 25,000 cups of coffee, 17,000 bottles of soft drinks a day. A network of 68,000 miles of wires connects the Pentagon by telephone with the rest of the world.

Skyscraper Hospital on City's Edge

The National Airport, also on the Virginia bank of the Potomac, was opened in June, 1941. By February, 1942, monthly passenger arrivals and departures approached the 50,000 mark. Commercial traffic has since been sharply reduced. The 729-acre air terminal includes the land of the old Custis home where the adopted children of George Washington lived until they moved to Mount Vernon.

Gleaming landmark in the open country northwest of the city is the new

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American industry meets Mexican ore at the border like a host ushering in a guest at the front door. The country's largest antimony smelter is on the Rio Grande at Laredo, Texas. Railways bring ore across the border and soon carloads of tin-white antimony "cakes" (slabs of cast antimony 10 inches square and 2½ thick) roll north to factories. The price is about 14 cents a pound.

Scrap is important in the antimony industry. About half of the metal used in the United States in recent years has been salvaged from old battery plates, cable sheaths, lead pipe, and such odds and ends as radiator caps and candlesticks.

Antimony has been known since the 15th century. Its melting point is 1,166 degrees Fahrenheit. A cubic foot of it weighs 419.2 pounds, or roughly twice as much as iron or half as much as lead. Its chemical symbol is Sb. Its chief ore is stibnite (Sb_2S_3), for which Stibnite, Idaho, is named.

NOTE: For additional information on antimony, see "Metal Sinews of Strength," in the *National Geographic Magazine* for April, 1942.

See also, in the GEOGRAPHIC SCHOOL BULLETINS, October 20, 1941: "Strategic Materials: No. 9, Antimony Is Lead's Partner."

Bulletin No. 3, January 17, 1944.

J. Baylor Roberts

ANTIMONY AIDS LINESMEN IN KEEPING TELEPHONE WIRES ALIVE

Antimony is the A in the telephone repair man's ABC's, studied in the telephone company's plant school. An apprentice halfway up a pole (left) is using a portable phone at a cable terminal box to test the wires in the cable attached to the pole. Cables are made up of cotton-insulated copper wires twisted together and enclosed in a sheath of lead alloy. As the essential part of this alloy, antimony protects telephone wires within from corrosion, from moisture that would cause short circuits and cut off communications. Aerial cables are suspended from steel or bronze wires by metal loops placed at intervals of two feet (at top, foreground). Underground cables carry bunched telephone wires in cities where aerial lines would result in a virtual forest of poles, and in these too antimony works for victory.

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Geo-Graphic Brevities

VITEBSK A RUSSIAN RAILWAY JUNCTION

EMBATTLED Vitebsk, focus of the U.S.S.R.'s winter offensive in the north, is an important railway center. It is a junction on the railroad between Smolensk, 80 miles southeast, and Riga, Latvia, which is the main line from the Baltic to Moscow. At Vitebsk this line is crossed by the railway from Leningrad to Kiev. The Nazi seizure of Vitebsk in July, 1941, was a move in isolating Leningrad, the U.S.S.R.'s second-largest city.

Vitebsk is situated in the northeastern corner of the White Russian S.S. Republic of the U.S.S.R. The city straddles the West Dvina River where it joins the Vitba.

Before Nazi attack Vitebsk was a manufacturing as well as a railway center. Its peacetime products were glassware, needles, farm machinery and implements, and leather goods, including boots and shoes.

War is an old story to Vitebsk. Since the beginning of the 11th century, when it belonged to the principality of Polotsk, considerable fighting has taken place in and around it. In 1101 Vitebsk became chief city of a new principality of the same name. In 1320 Lithuania took the city under her wing. Poland appropriated it in the 16th century; and in 1772, at the time of the first partition of Poland, it was annexed to Russia. In 1812 Napoleon occupied the city on his march to Moscow.

With a population of 167,000, Vitebsk is approximately the size of Hartford, Connecticut. Somewhat more than half of its residents were White Russians and Great Russians. The remainder were Jews.

Note: Vitebsk is shown on the Society's Map of Europe and the Near East.
See also in the *National Geographic Magazine:* "I Learn About the Russians," November, 1943; "'Magnetic City,' Core of Valiant Russia's Industrial Might," May, 1943; and "Mother Volga Defends Her Own," December, 1942; and in the GEOGRAPHIC SCHOOL BULLETINS, November 15, 1943, "Russian Victories Reclaim Industrial Cities."

* * * * * *

"NEW" SEAWEED FOOD LONG KNOWN TO CHINESE

The University of California's study of seaweed as a possible addition to American menus is a reminder that some species of aquatic plants have long been a staple food in other lands.

Chinese literature tells of pondweed and duckweed boiled and eaten centuries ago. Seaweed was also used as a throat medicine long before the iodine in it was recognized as an effective treatment for goiter.

North American Indians of the Pacific coast feared salt as a white man's food which turned his hair gray and hastened death. Refusing to use it on their food, they gathered the sea lettuce and ate it to supply seasoning. Hawaiians ate it raw as a salad or baked it with meats. At least 75 edible varieties grow in the waters around Hawaii. The Japanese have cultivated seaweed for food for years.

Probably the most important types of edible seaweed are those producing the jellylike substance known as agar-agar. This gelatinous material with the repetitive name was first introduced into Japan by the Chinese as a substitute for bird's-nest soup stock. The Japanese, who called it kan-ten ("cold weather") because it had to be made during the winter, became the world's largest producers.

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National Naval Medical Center in Montgomery County, Maryland. Within its 270-foot central tower building and wings is an 800-bed hospital where wounded of the U. S. Navy, Marines, and Coast Guard from current war fronts are convalescing. The building also houses postgraduate medical and dental schools, a large medical library, and a research institute.

At the head of the parade of alphabetical war agencies is the White House staff now numbering 756. The War Production Board has 14,000 workers in Washington. Of 51,000 Office of Price Administration employees, one-tenth work in the Capital. Of 75,000 Treasury Department workers, one-third are part of the "home office" scene.

Washington has 4,700 taxis, each now limited to 36,000 miles annually. Many ran up two or three times this mileage before tire and gasoline rationing. Passengers now ride in groups instead of singly.

Missions of military men, civilian officials, and clerical workers from each of the United Nations are led in numbers by some 2,000 British subjects who transact their government's affairs in Washington.

Note: Washington is shown on the Society's Map of Historic and Scenic Reaches of the Nation's Capital.

For additional material on Washington, see "Wartime Washington," in the *National Geographic Magazine* for September, 1943; "Washington—Storehouse of Knowledge," March, 1942; "Old Masters in a New National Gallery," July, 1940*; "The Nation's Capital by Night," April, 1940*; and "Washington, Home City and Show Place," June, 1937.

See also, in the GEOGRAPHIC SCHOOL BULLETINS, April 7, 1941: "Defense Emergency Gives Washington, D. C., Boom-Time Tempo."

Bulletin No. 4, January 17, 1944.

Willard R. Culver

TREATY TRINKETS ARE SOUVENIRS OF WASHINGTON'S INTERNATIONAL CHORES

One of the duties which Washington must perform in war and peace is to keep records of the nation's activities. The National Archives must preserve all important documents, decide which records to discard. Always saved are treaties, original laws, pension and military service records, for example. Among original treaties in the Archives Building are elaborately decorated extradition agreements with the Orange Free State of South Africa (left) and Turkey (center); a century-old trade treaty with the Netherlands (background); a property-rights agreement of 1899 with Great Britain (open, foreground) which was signed by Queen Victoria.

Until the war cut the supply line, the United States obtained from Japan all the agar-agar used for ice cream, sherbet, puddings, cosmetics, and medicines.

Now the United States is exploring its own coastal waters for valuable seaweed. The giant kelp in the waters off the California coast, lifted to commercial importance when World War I cut off imports of German potash for fertilizer, is again being harvested.

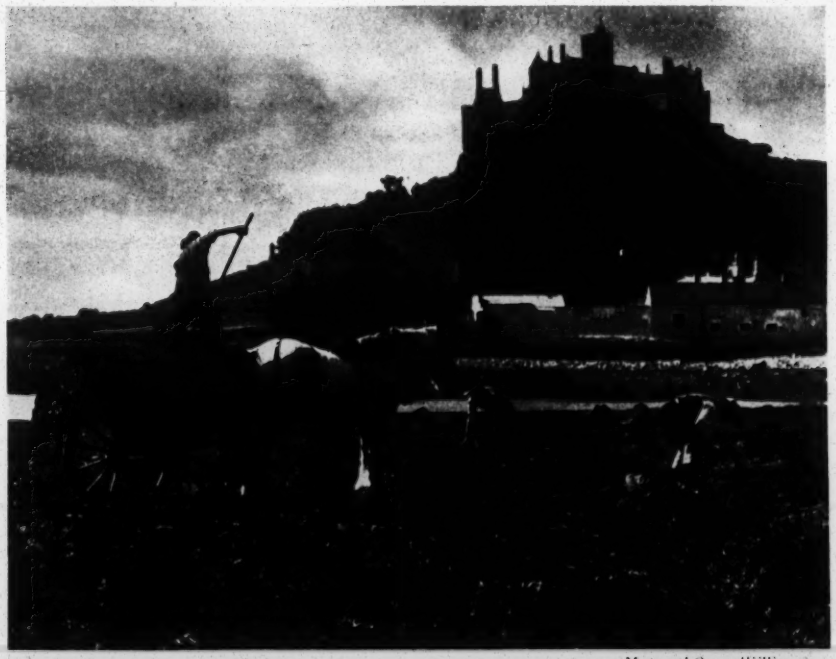
Irish moss, clogging Atlantic coastal waters from Maine to North Carolina, is being raked from the sea and marketed. As far back as 1835 this moss was imported from Ireland as a treatment for tuberculosis at a cost of between one and two dollars a pound. High import costs forced Atlantic Coast moss commercial recognition several years ago.

Much of the Maine-to-Carolina moss is now prepared for use in desserts, medicines, cosmetics, and lotions. It is also used in chocolate milk, to keep the chocolate from separating from the milk and settling to the bottom.

In addition to its services as a food, seaweed has been used as a fertilizer and as a fuel. In Iceland it has been buried in deep trenches, tamped into almost solid cakes, and later chopped into chunks for cattle and sheep fodder.

The United States uses algin, made from kelp, in the binder for cartridge primers. Some of the camouflage used by American armed forces also comes from seaweed.

Bulletin No. 5, January 17, 1944.



Maynard Owen Williams

BRINGING IN THE SEAWEED HELPS BRING BRITAIN'S HARVEST HOME

Along the shores of Mount's Bay, which bites into England's southwestern tip between Land's End (England's westernmost point) and the Lizard (the southernmost), quantities of seaweed are gathered to be used for fertilizer. The men with sickles are cutting through tangled masses of the soggy brown weed to loosen it for the rakers who drag it into heaps. It is then piled onto the two-wheeled horsecart and carried away to be processed into fertilizer for the market gardens which flourish in the mild climate of this corner of Cornwall. The harvesters work quickly to gather in as much kelp as possible during the three-hour period of low tide. Behind them, like a miniature of Normandy's Mont St. Michel, St. Michael's Mount (background) is topped with a 5th-century priory and a massive towered mansion.